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ABSTRACT

An informal study found that zoo visitors want to know not just the name, weight, and age of animals in a collection, but also about diet, reproduction, life span, and behavioral characteristics. What kinds of learning opportunities, beyond enhanced signage, can be offered to the sophisticated new breed of visitors in zoos, aquariums, and nature parks? This digest focuses on how learners process information and how professional staff and visitors can promote learning at the zoo. Discussion includes: informal learning environments, learning styles, implications for informal learning environments, and reflection as a retrieval strategy. (Contains 13 references.) (MKR)

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Fruit Bats, Cats, and Naked Mole Rats: Lifelong Learning at the Zoo

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ERIC CSMEE Digest

Clearinghouse for Science, Mathematics, and Environmental Education EDO-SE-94-2 September 1994

Fruit Bats, Cats, and Naked Mole Rats: Lifelong Learning at the Zoo

Barbara S. Thomson & Jason J. Diem

It is a hot and muggy day and a group of seven friends and relatives decides to visit the zoo. These seven rather diverse members of *Homo sapiens*, ranging in age from 5 to 85, are all eager to have a good time, but how does an informal learning environment such as a zoo, aquarium, or nature park assure that people with widely varying interests all have a meaningful experience? Are the experiences of these visitors going to be mainly recreational and social? Can zoos and other informal learning centers strategically plan and implement ways for "visitors on safari" to explore new and personally satisfying learning opportunities? Might family members also sharpen their skills at learning informally? This digest focuses on how learners process information and how professional staff and visitors can promote learning at the zoo.

Though zoos have always tried to provide quality viewing of animals and appropriate identification signage, educational television programs and wildlife publications have increased the flora and fauna literacy levels of visitors, as well as heightened their curiosity and interest. An informal study (Columbus Zoo, 1991) of questions asked the 225 Columbus Zoo docents in 1991 indicates that visitors want to know not just the name, weight, and age of animals in a collection but also about diet, reproduction, life span, and behavioral characteristics. What kinds of learning opportunities, beyond enhanced signage, can we offer the sophisticated new breed of visitors in our zoos, aquariums, and nature parks?

What Are Informal Learning Environments?

Learning is most often viewed as something we do in school or in a formally organized setting. However, educators know that when children are tested for academic achievement in the spring and again in the fall, scores increase for some children. Informal environments are rich resources for learning throughout our lives.

Although zoos, aquariums, museums, and nature parks are defined as informal learning environments, they offer both formal and informal educational opportunities. Formal experiences occur in the form of classes, workshops, day camps, or tours and usually require a special fee to cover the cost of a professional teacher or leader.

Informal learning opportunities, including exhibits and mini-shows, are structured by educators, but the decision to participate is made by the individual (Heimlich, 1993). Visitors are not held accountable for learning outcomes and may walk away from any experience they decide not to pursue. Thus, each visitor designs his or her own learning experience through choice and commitment. Appealing to visitors from different educational, social, and cultural backgrounds is a challenging but worthwhile goal for informal educators. Learning by choice can be exciting and memorable!

Why Are Informal Learning Environments Important?

Classroom teachers use a variety of materials and activities—reading, writing, discussing, computer programs, videos, tape recordings, lectures—that are helpful to the learning process. But, imagine an environment where learners have an opportunity to see and interact with real things, not just pictures, words, or recorded sounds. Informal learning environments provide firsthand experiences for people of all ages. In our society today, everybody, regardless of socioeconomic level, is exposed to media that bring exciting images of the world into our homes. Informal educational settings go one step further by allowing us to experience—not just imagine—reality. Hearing firsthand the early evening vocalizations of white faced gibbons, the reprimand of a mother gorilla to one of her energetic adolescent offspring, or watching a family of newborn ducklings experience water for the first time are visual and auditory treats which cannot be duplicated in a formal classroom or on a television screen.

Learning Styles

Whether in a formal classroom or an informal learning environment, each of us has certain perceptual strengths, or preferred modes of processing information. Research indicates that some of us are visually oriented, some are auditory, some are kinesthetic (action oriented), and some are tactual. Most of us can process information in any mode but learn best in one or two preferred modes (Gardner, 1991).

Children enter kindergarten as kinesthetic and tactual learners, moving and touching everything as they learn. By second or third grade some students have become visual learners, as they process more and more information through reading and pictures. During the late elementary years some students, primarily females, become auditory learners, who like to listen and discuss. Yet, many adults, especially males, maintain kinesthetic and tactual strengths throughout their lives (Dunn, 1993).

Carbo's (1987) research indicates that whenever learners process new or difficult information, they should be introduced to the activity using their primary perceptual strength. Learning should be reinforced using the second perceptual strength. If you are primarily an auditory learner, your first encounter with something new should ideally be in an auditory mode. If you are also a tactual learner, you should reinforce with a hands-on activity. If your second strength happens to be visual, reinforce by viewing a picture, diagram, or better yet, the real thing.

The power of an individual's perceptual strengths or learning modalities to facilitate the processing, retention, and application of new ideas has been studied by numerous researchers (Brunner & Hill, 1992; Ingham, 1991; Nelson, 1993; Stone, 1992). But what does the theory of learning styles imply for a zoo?

Implications for Informal Learning Environments

Every learner needs to assume major responsibility for his or her own learning. However, the education staff at zoos and other informal learning centers also has a responsibility to provide diversity of learning opportunities. Strategic planning with a knowledgeable staff can create a stimulating learning environment to accommodate various perceptual styles. When educators at these facilities do not understand the importance of meeting the learning needs of their clients, visitors will focus on recreational and social activities, rather than learning activities. Triggering perceptual strengths must be a goal for both visitors and staff.

Auditory learners truly appreciate lectures and discussions. Meet-a-keeper talks are quite meaningful to auditory learners and take only a few minutes of a keeper's time. Auditory learners will remember the voices, as well as what was said, and will be able to retrieve information easily at a later date.

Visual learners at this same meet-a-keeper talk will focus on the animal that the keeper is showing the visitors. A visual learner also enjoys reading about the animals and will utilize the *Zoo Guide* and the signage that is provided. Visual learners are usually the ones who use and can interpret maps correctly. Each group of visitors needs a visual

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learner to process the local information map! Visual learners also benefit by taking pictures or drawing sketches in a journal. Look at a journal kept by a visual learner and you will see lots of diagrams, doodles, arrows, and labels beside the sketches.

Tactual learners need to have something real to touch, a challenge when working with exotic animals. However, hair combed from an animal or a snake skin can be passed around a group. Zoo volunteers may work at conveniently located carts filled with both real animal items and simulated comparison items. Keepers sometimes make plaster imprints of gorillas' hands while they are under sedation for their yearly physical. Comparing a gorilla's handprint with human hands is fun for everyone but is especially meaningful to the tactual learner. These learners also enjoy keeping a notebook, but their notebook entries look very different from the visual learner's notebook. Writing down as much information as possible is useful for the tactual learner, and the retrieval of information will be extensive, even after the notebook is closed. For youngsters who are not yet fluent writers, drawing a picture and having an adult print labels will help these learners process new information efficiently.

Kinesthetic learners need to be involved in everything. Many zoos have play areas with educational, interactive toys and games for young children, but kinesthetic adults also need opportunities to become actively involved. Comparing your sprint to the sprint of a cheetah, standing by a cutout of a full grown giraffe, and seeing if you can jump as far as a kangaroo are fun for adults and valuable for the kinesthetic learner. Matching wits with animals on a computer simulation game is another kinesthetic challenge. Street dramas are a great way to learn about animals and involve kinesthetic learners of all ages. How do you identify kinesthetic learners? They volunteer for activities and are eager participants. They are the ones who are willing to hold the snake and walk through the audience or allow cockroaches to crawl all over their arms.

Both educators and parents need to realize the importance of learning through perceptual strengths. Mismatching perceptual modalities can be a disaster. For example, giving an auditory or visual learner a snake or cockroach to hold is probably not a wise move. Both the visitor and the organism will be uncomfortable. Parents and educators need to be good observers to identify the learning strengths of each individual. Recognizing the preferences of others helps us appreciate the diversity of learners and nurture the strengths of all.

Motivation is another critical variable that can facilitate learning in an informal setting. If a visitor encounters an activity in a modality that is not a personal strength, interest in the subject can overcome any perceptual weakness. Feeding shrimp to a bat ray or fish to a seal is a unique and highly motivating experience, even for the auditory learner. Hearing that Colo, a lowland gorilla, would not return her keeper's keys for one orange but traded one key at a time for multiple oranges is an intriguing vignette that can inspire anyone to learn more about gorillas and other animals. Educators and parents need always to be on the lookout for interesting, motivational activities and tidbits.

Reflection as a Retrieval Strategy

A key link between experience and learning is reflection, or thinking back on an experience. Reflection is defined by Hutchings and Wutzdorff (1988) as the "ability to step back and ponder one's own experience; to abstract from it some meaning or knowledge relevant to other experiences" (p. 15). For Boud, Keogh, and Walter (1985), reflection is "an important human activity in which people recapture their experience, think about it, mull it over and evaluate it" (p. 19). According to Jarvis (1987), reflection is an essential phase in the learning process. For an experience to become meaningful, people have to think about it. But, reflection is a personal process and may vary in intensity, duration, and degree from one individual to the next.

All seven of our zoo visitors need an opportunity to reflect on their day in a way that is meaningful and relevant to them. Discussing activities with the rest of the group is perfect for auditory learners. Visual learners will enjoy taking home a book, a poster, or even a postcard of their favorite animal. Tactual learners will be happy with a stuffed animal or a pine cone bird they made at a "make it, take it" table. Teach kinesthetic learners a sidewalk animal game and provide copies of the directions to take home.

Staff members at informal learning sites need professional development training so they can better respond to the reflection needs of learners. Creating closure and questions for thought are useful in the various interactions that staff members have with visitors. Mini-talks, tactual hands-on materials, and zoo promotional handouts can all be used in creative ways to encourage visitors to reflect on their activities in a meaningful way.

Conclusion

The American Association for Zoological Parks and Aquariums (AAZPA; recently renamed American Zoo and Aquarium Association) is the national organization for professionals who work with animals in informal learning environments. AAZPA (1992) identified four goals in its mission: (1) Conservation, (2) Recreation, (3) Research, and (4) Education. People enjoy nature facilities for all four of these reasons, but many sites do not have staff trained to develop the signage, activities, talks, tapes, and printed materials necessary to appeal to the vast diversity of visitors.

Understanding perceptual learning modalities is crucial for parents and staff in order to provide experiences that will motivate repeat attendance and continuing interactions with animals. The education staff has a responsibility to provide effective ways for all visitors to learn. Parents have a responsibility to model appropriate learning behaviors and to help their children learn, especially considering their perceptual strengths. The more we find out about how *Homo sapiens* learns, the better we can utilize this information, whether we be volunteers, staff, parents, or a group of adults enjoying a simulated safari experience. The animals deserve it and so do we.

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